Certified
Naval Battle Groups

Keeping Legacy Systems
Viable Navy Combat Direction Systems: Challenges and Solutions

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Keeping Legacy Systems Viable

Naval Combat Direction Systems: Challenges and Solutions

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NAVSEA
DAM NECK
Combat Direction Systems Activity

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NAVSEA DAM NECK Combat Direction Systems Activity

Outline

- CDSA DN Overview
- Challenges
- Processes
- Solutions
- Evolution

CDSA Dam Neck Overview

CDSA Dam Neck Introduction

- Commissioned as a Command in Dec 2000 & Realigned Under Dahlgren Division
- SEI CMM Level 3 Rating
- Less than 30 Minutes from Amphibious Base and Norfolk Operating Base
- Located on VaCapes Range
- Key Player on Distributed Engineering Plant (DEP) architecture
- DREN / SDREN Connectivity & Node with HPC
- Acquisition Community / DAWIA Qualified Personnel
- Battle Force Tactical Training Development Agent
- Battle Force Action Officer for Atlantic Fleet
- Currently Supporting Fleet Requirements & Combat System Baselines Including FFG's, DD963's, Amphibs and CVs.

ORGANIZATION

CNO
ADM Vern Clark

Commander
NAVSEA
VADM Phillip Balisle

Commander
NSWC
RADM Mike Mathis

Commander
NSWC Dahlgren
CAPT Lyal Davidson

Commanding
Officer
CDSA Dam Neck
CAPT Dan Beach

Keeping America's Navy #1 in the World

Strategically Aligned to Support the Fleet and Developing Programs

Challenges

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Modernization Objectives

- Minimize Development & Deployment Costs
- Maximize Evolvability and Evolution
- Meet System Performance Requirements
- Maintain Legacy System Functionality
- Minimize Risk
- Insure Quality Product

SHIPBOARD DISPLAY EMULATION (SDE) UPGRADE

Congressional Funding Authorized (FY00)

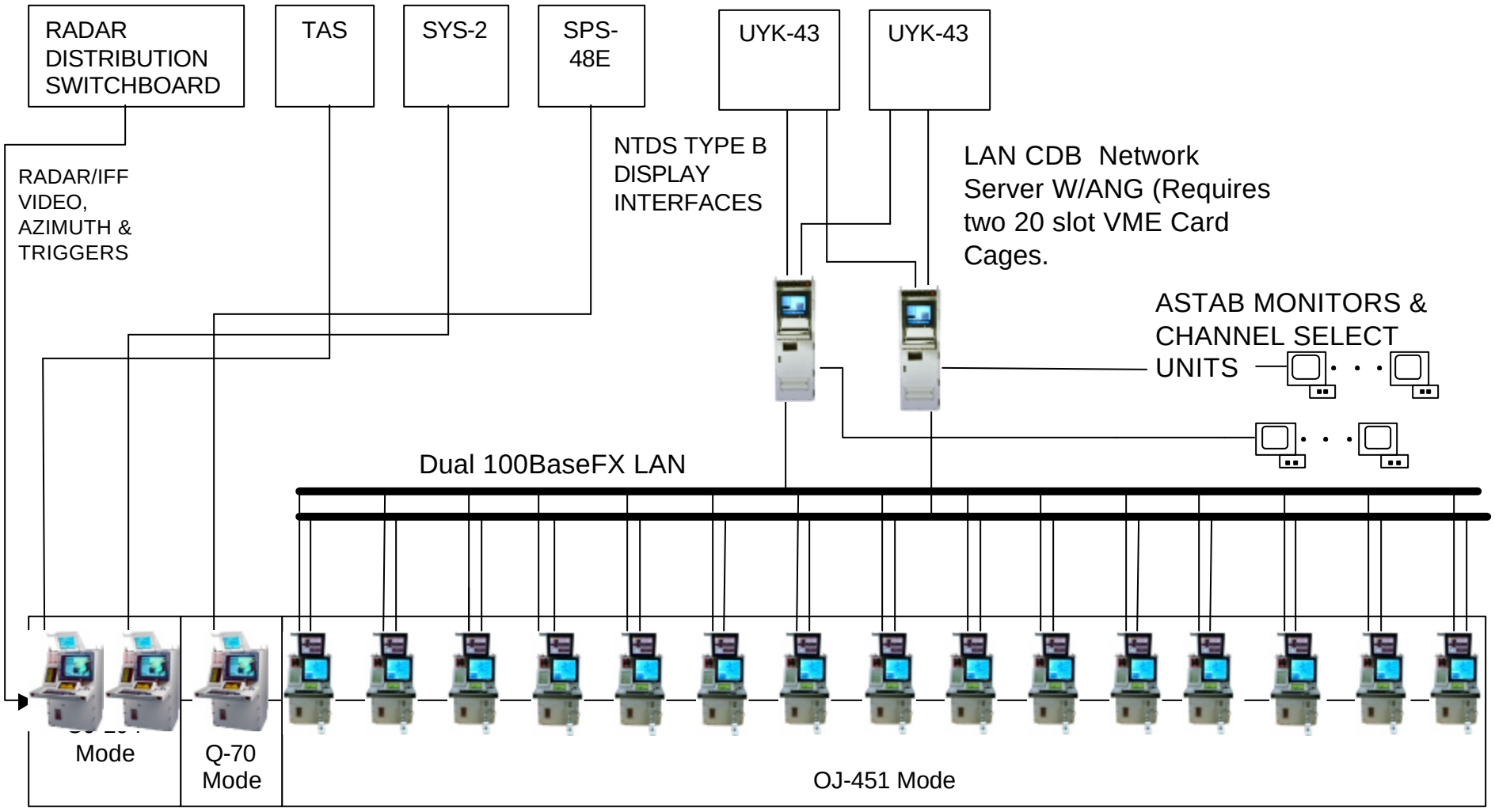
- Directs replacement of maintenance-intensive AN/UYA-4 display consoles with COTS-based emulators in LHA 1, 3 & 5
- SDE Upgrade includes replacement of all AN/UYA-4 equipment

"SHIPS IN SERVICE UNTIL 2011-2015"

Existing Equipment	Replacement Equipment
OJ-194A(V)3 Consoles (ACDS) (Qty 15)	SDE (CNDi) AN/UYQ-70 Workstations (Qty 15)
OJ-194(V)3 Consoles (TAS/SYS-2/48E) (Qty 3)	SDE (CND) AN/UYQ-70 Workstations (Qty 3)
AM-4534/UYA-4(V) PA/SG (Qty 1)	AN/UYQ-70 RBCi (Qty 2)
CV-2356/UYA-4(V) BVP (Qty 1)	AN/UPX-38 Auto ID (Qty 1)
SB-2780/UYA-4(V) RDDS' (Qty 3)	SB-4229A(V)11/SP ASDS Swbd (Qty 1)
CV-2095(V)6/UYA-4(V) RAC (Qty 1)	CV-3989(V)1/SP ASDS Converter (Qty 1)
LS-537A/UYA-4(V) Remote Intercomms (Qty 15)	PICTs (Qty 15)

Processes

LHA SDE ARCHITECTURE



INTEGRATION AND TEST

- Dam Neck established a facility for in-house system level integration, test, software and ISEA support

- Facility provides:
  - ACDS interfaces - via actual equipment or simulator
  - ASDS interfaces using live radar input
  - Ancillary inputs -chilled water, power
  - Equipment for Geoserver integration

- Objective is to correct any discrepancies and gain a high degree of confidence prior to formal CSIT and shipboard installation

Solutions

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Peripheral Emulation System

- RD-358 or RD-358A Magnetic Tape Unit (7 or 9 Track)
- UYH-3 High Speed Disk (Basic or File Management Firmware)
- USQ-69 Data Terminal Sets
- TT-624 Printer
- UYK-43 DCU Display Control Unit
- OJ-172 Data Exchange Auxiliary Console (DEAC)

LHA Peripheral Emulation System

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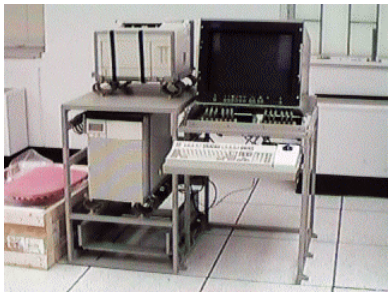
Peripheral Support Unit (PSU)(2)

UYQ-70 EPS Air-cooled

AN/USQ-69(2)
TT-624/UGC-13(1)
RD-358(1)
AN/UYH-3(1)

AN/USQ-69(2)
TT-624/UGC-13(1)
RD-358(1)
AN/UYH-3(1)

Peripheral Control Station (PCS)



TAC-4 w Rugged Stand

PSU Control (2)
UYK-43 ADCU (2)
USQ-69 (2)
TT-624(1)

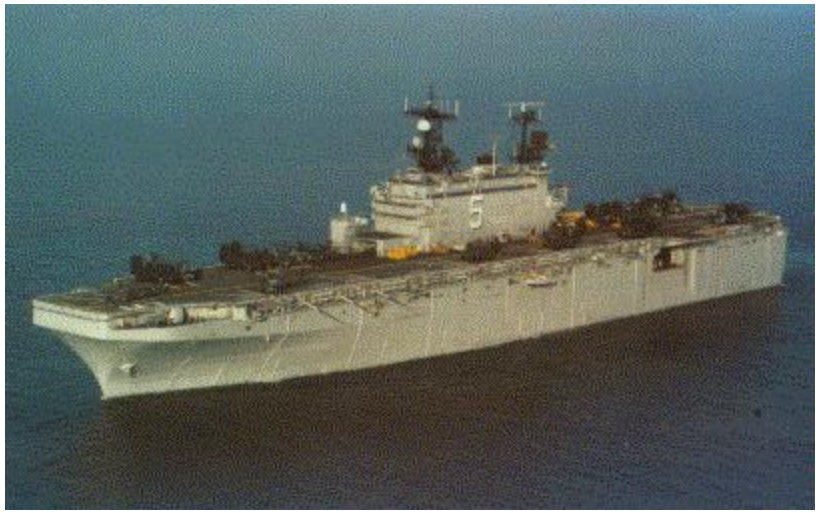
Command Support Unit(CSU)

UYQ-70 EPS Air-cooled

CV-2036 (KCMX)

SDE UPGRADE IMPROVEMENTS/CAPABILITIES

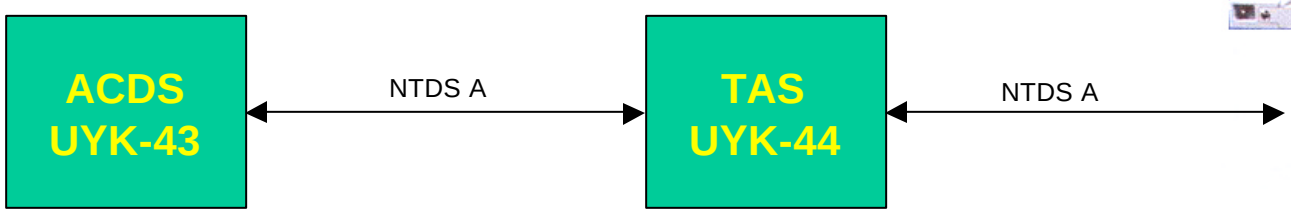
- Replacement of existing ACDS OJ-194A displays: SDE provides color displays while operating in the OJ-451 emulation mode
  - Aligns with other LHAs, LHDs and CV/CVNs by utilizing a common tactical software
  - SDE architecture provides for integration with Command Station to utilize mapping capability

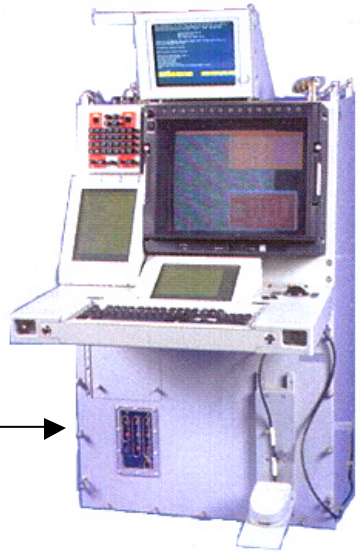


- Replacement of existing OJ-194 TAS/SYS-2 displays: SDE provides color displays while operating in OJ-194 emulation mode
- Replacement of existing OJ-194 SPS-48E display: SDE provides a color display while operating in AN/UYQ-70 native mode
- AN/UPX-38 Auto ID capability is integrated with ACDS, SYS-2, SGS/AC
- SDEs contain extensive built-in diagnostics for maintenance/test
- Relieves ship of costly AN/UYA-4 maintenance/training

MK 23 TAS

- **UYQ-70 Solution via Direct Computer Interface**
  - OJ-194 Emulation (LHD 7)
  - Specific TAS Software Required - Currently Available
  - Minimal Test, Logistics and Cost Impact

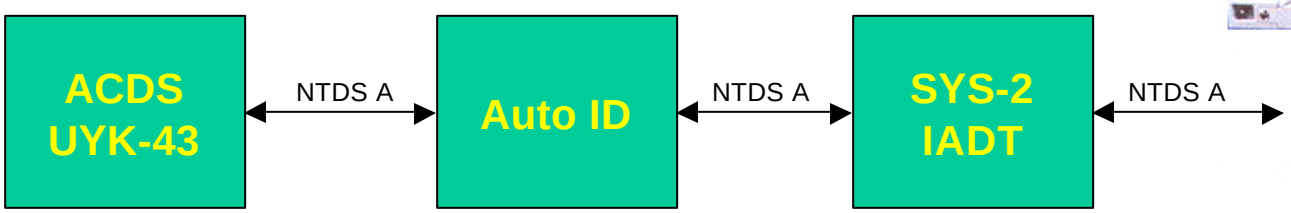


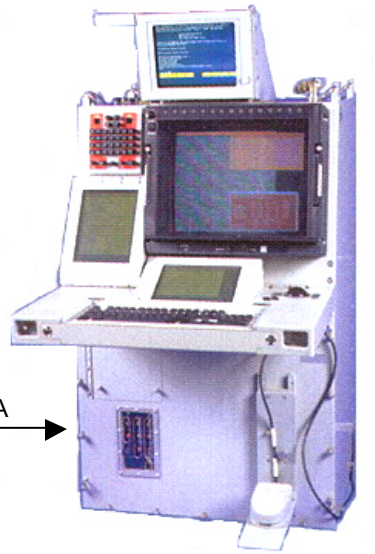


Q-70 CND Console

AN/SYS-2

- **UYQ-70 Solution via Direct Computer Interface**
  - OJ-194 Emulation (LHD 7)
  - Minimal Test, Logistics and Cost Impact
  - Specific SYS-2 Software Required - Currently Available
  - Auto ID configuration previously implemented in CV/CVN ship classes

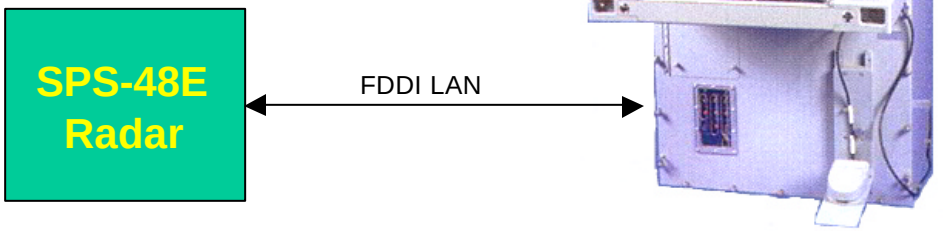


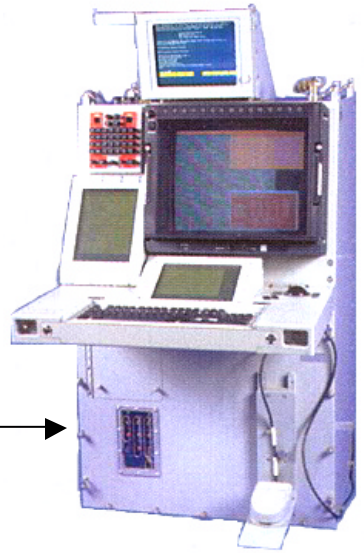


Q-70 CND Console

AN/SPS-48E

- **UYQ-70 Solution via FDDI Interface**
  - AN/SPS-48E Field Change #13 to Incorporate FDDI Interface to 48E RSC
  - UYQ-70 Native (LHD 7)
  - Minimal Test, Logistics and Cost Impact
  - Specific AN/SPS-48E Software Required - Currently Available





Q-70 CND Console

INTEGRATION AND TEST

- Test plan at NAVSEA Dam Neck:
  - Functional test - Standalone
  - Integrate into the system and run:
    - POFAs
    - Tailored “LHA 2/4” System Integration Test
    - Loading and endurance
    - Bandwidth utilization
  - SOM verification

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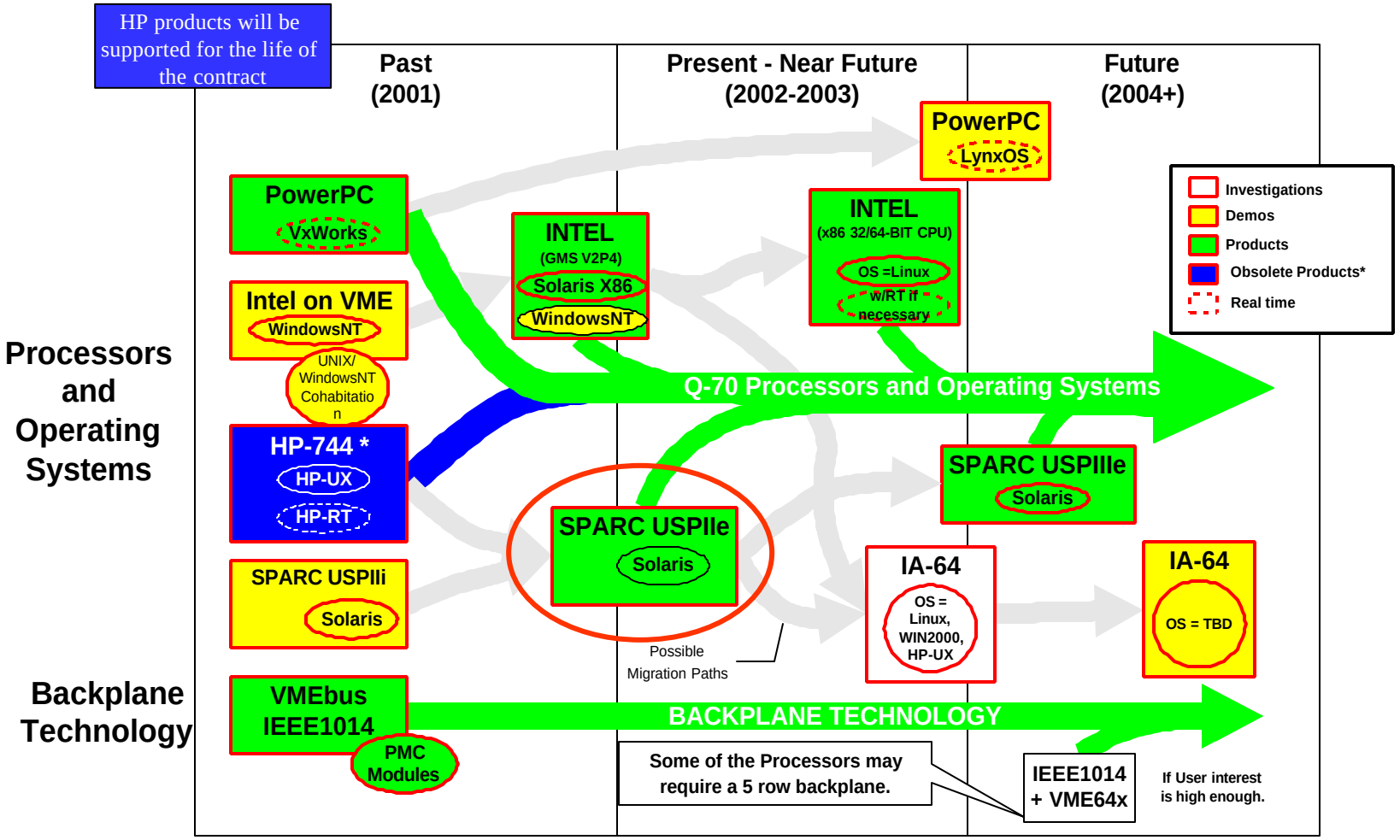
On-Board the Ship!!

Q-70 VME-based Roadmap

Q-70 will support more VME-based CPUs and OSs.



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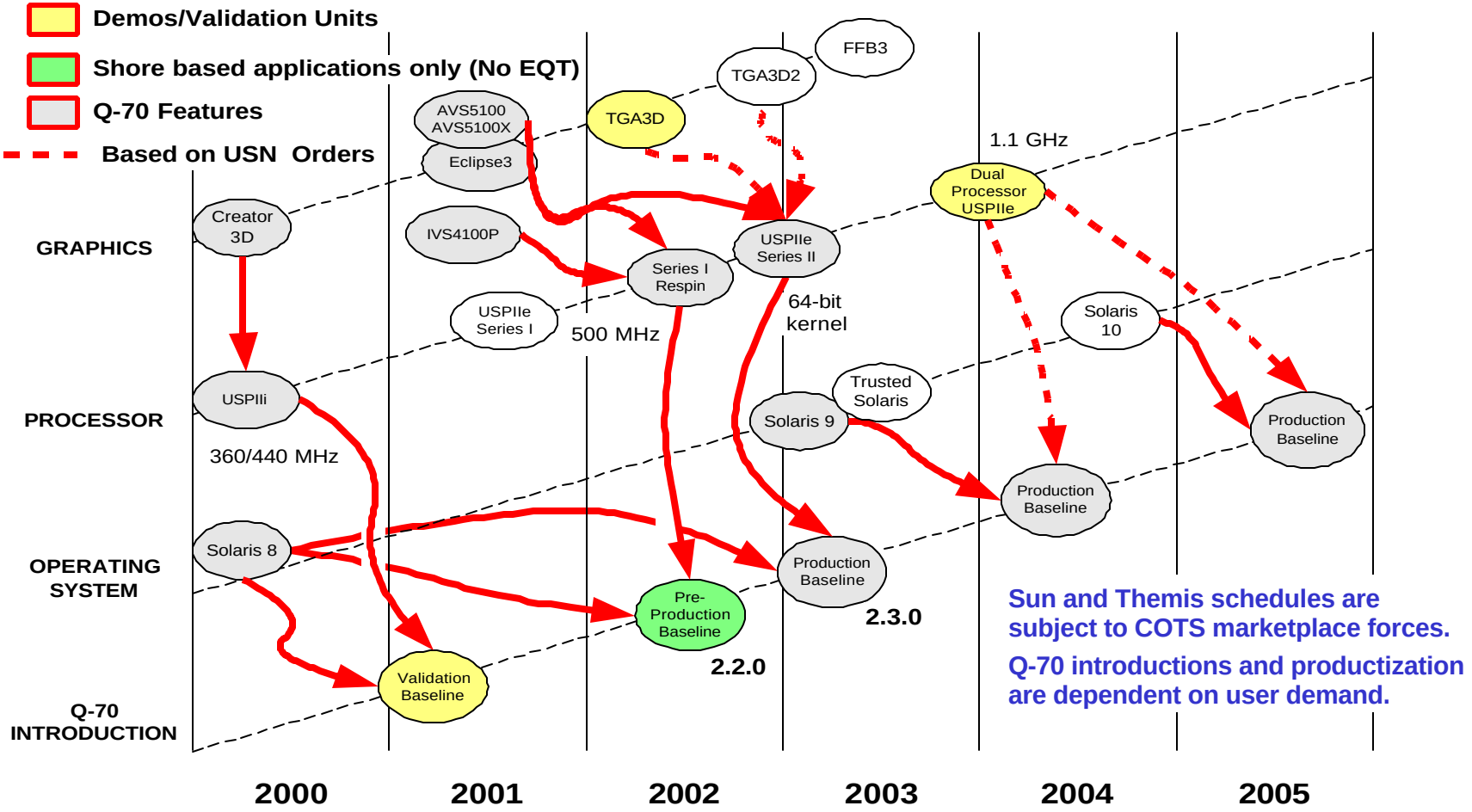
SPARC/Solaris Road Map

Future Q-70 baselines will provide even greater performance.



Sun and Themis schedules are subject to COTS marketplace forces.

Q-70 introductions and productization are dependent on user demand.